

ABSTRACT OF THE DISCLOSURE

[0041] Embodiments in accordance with the present invention provide alternative materials, and methods of forming such materials, that are effective as dielectric layers. Such embodiments include forming metal-containing dielectric layers over a silicon-containing substrate where a metal-containing layer is first formed and that treated to form a dielectric layer. Dielectric layers formed by methods of the present invention have a dielectric constant greater than that of silicon dioxide, and can have an equivalent oxide thickness of less than 2 nanometers. Such dielectric layers are useful in the forming of a variety of semiconductor devices such as transistors, capacitors and the like where such devices and integrated circuits formed from such devices are encompassed by embodiments in accordance with the present invention.

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